1145.1.17

Department of Energy
Idaho Operations Office
850 Energy Drive
Idaho Falls, Idaho 83401-1563

October 27, 2000

Mr. Wayne Pierre, Team Leader
Environmental Cleanup Office
U.S. Environmental Protection Agency
Region X
1200 Sixth Avenue
Seattle, Washington 98101

Mr. Dean Nygard, Site Remediation Manager
Waste Management and Remediation Division
Idaho Department of Environmental Quality
1410 N. Hilton
Boise, Idaho 83706

SUBJECT: Disposal of WAG 5 ARA-16 and ARA-25 Soils and Piping at the Radioactive Waste Management Complex (OPE-EM-ER-205-00)

Dear Mr. Pierre & Mr. Nygard:

Consistent with the Operable Unit (OU) 5-12 Record of Decision (ROD)[1], some radiologically contaminated soil and piping from Waste Area Group (WAG) 5 will be disposed of at the Radioactive Waste Management Complex (RWMC) low-level waste repository, located at the Idaho National Engineering and Environmental Laboratory (INEEL) beginning November 6, 2000.

Waste Area Group 5 is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)[2] designation for the INEEL Auxiliary Reactor Area (ARA) and the Power Burst Facility. Operable Unit 5-12 is the comprehensive OU for WAG 5. The radiologically contaminated soil and piping are located at WAG 5 Sites ARA-25 and ARA-16, respectively. The quantities of material under consideration are approximately three waste boxes (1.2 × 1.2 × 2.4 m [4 × 4 × 8 ft]) of piping and 54 m^3 (71 yd^3) of contaminated soil.

The ROD identified disposition of the ARA-16 piping: "pipes will be removed, decontaminated to the extent practicable, and either recycled or sent to the RWMC for disposal depending on

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[1]. U.S. Department of Energy Idaho Operations Office, U.S. Environmental Protection Agency, Idaho Department of Health and Welfare, January 2000, *Record of Decision, Power Burst Facility and Auxiliary reactor Area, Operable Unit 5-12 Idaho National Engineering and Environmental Laboratory, Idaho Falls, Idaho.*

[2]. 42 USC § 9601 et seq., December 11, 1980, "Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA/Superfund)," *United States Code.*

the degree of decontamination that is achieved." The ARA-25 soil will need to be removed during the piping remediation. Therefore, prompt disposal of the soil makes sense rather than waiting for the INEEL CERCLA Disposal Facility (ICDF) to open.

The ROD also addresses the disposition of the contaminated soil removed from ARA-25: "Contaminated soil will be characterized and sent to the INEEL Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Disposal Facility (ICDF) or another location within the INEEL for permanent disposal." The ICDF will not be built for several years and the soil is a low-level radioactive material suitable for "another location within the INEEL" such as the RWMC.

The ARA-16 piping and the ARA-25 soil are contaminated primarily by Cs-137. Although other beta and gamma emitters are present at low levels, the most restrictive radionuclide is Cs-137, and the concentration of the Cs-137 is three orders of magnitude greater than that for Co-60. The Cs-137 concentrations in the soil range from 226 to 449 pCi/g. The INEEL waste acceptance criteria (WAC) limit for disposal of Cs-137 at the RWMC is 8 Ci/m^3.[3] Using a soil weight of approximately 1.5 x 10E+06 g/m^3, this equates to a maximum of 6.74E-04 Ci/m^3 for the soil from ARA-25.

The piping is estimated to range from 9.1E6 pCi/g to 13.3E6 pCi/g Cs-137. This equates to 12 Ci/m^3 on the high end, which is above the INEEL WAC limit. The piping will be rinsed with high-pressure water for RCRA decontamination. This flush is expected to significantly reduce the curie content of the piping. If, after the initial decontamination the piping still does not meet the WAC for radionuclides for the RWMC, further decontamination will be conducted. Should it prove impracticable to decontaminate the piping to meet the INEEL WAC for the RWMC for radionuclide contamination, or to meet the clean debris standard, other disposal options for the piping will be pursued.

The ARA-25 soils were characterized as part of the site investigation for the ROD and are addressed in the ROD: "Results from the analysis of the soil samples demonstrate that the contaminated soil at ARA-25 is not classified as RCRA-hazardous waste." Thus, the soils are classified as low-level radioactive waste. Both of these waste streams will, therefore, meet the INEEL WAC prior to sending them to the RWMC.

The ARA-16 piping was not sampled as part of the comprehensive remedial investigation because of both the technical difficulty involved in sampling the buried inactive piping and as low as reasonably achievable (ALARA) considerations. However, the waste liquid and solids in the tank that received waste from the piping were characterized and these data were used to establish that the piping is part of a tank system contaminated with Toxic Substance Control Act (TSCA)[4] and Resource Conservation and Recovery Act (RCRA)[5] regulated materials. The

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c. U.S. Department of Energy Idaho Operations Office, June 2000, *Idaho National Engineering and Environmental Laboratory Reusable Property, Recyclable Materials, and Waste Acceptance Criteria (RRWAC)*, DOE/ID-10381.

4. 40 CFR 761, *Code of Federal Regulations*, Title 40, "Protection of Environment," Part 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions."

e. 42 USC 6901 et seq., *United States Code*, "Resource Conservation and Recovery Act (Solid Waste Disposal Act)," October 21, 1976.

pipes will be subjected to an aggressive decontamination with a high-pressure water spray. Then they will be visually inspected, with a remote camera, to demonstrate that the pipes meet the clean debris standard under RCRA. It is expected that following the decontamination and the visual inspection, no oily residue will be observed remaining on the pipe surfaces. If on visual inspection an oily residue remains, further decontamination will be performed until the residue is removed, or other disposal options will be pursued for the piping. Thus, the possibility of detectable levels of polychlorinated biphenyls (PCBs) remaining is very slight. Insufficient amounts would be available to constitute a risk to the groundwater. In addition, once drained of all liquids, the pipes no longer will be regulated for disposal under TSCA (40 CFR 761.60(b)(6)(ii), because piping specifically is mentioned in the discussion of PCB articles, which are not regulated for disposal. Therefore, disposal in the RWMC is not prohibited under regulations. Furthermore, any RCRA or TSCA contaminants that could potentially migrate to groundwater have been removed from the piping. Therefore, a potential contribution to risk from organic solvent contamination or PCBs is eliminated.

The active portion of the RWMC is considered a low-level radioactive waste disposal unit, operated by the U.S. Department of Energy (DOE) under the Atomic Energy Act[6], as amended. Operations at the RWMC are governed by DOE orders. The attached disposal authorization letter from U.S. Department of Energy (DOE) Headquarters documents that the RWMC is in compliance with DOE orders and that the facility is authorized to operate. The attached documentation states that the RWMC composite analysis would be revised and reviewed by September 30, 2000. The composite analysis was revised, reviewed by the U.S. Department of Energy Idaho Operations Office, and a memorandum approving the document was sent to Jeff Mousseau, Manager, Waste Generator Services for BBWXT on September 29, 2000. A copy of this memorandum also is attached. A copy of the Composite Analysis and Performance Assessment was recently sent to the EPA and DEQ WAG 5 managers.

Based on the attached documentation and a review of the associated data from Sites ARA-16 and ARA-25, disposing of this waste in the active portion of the RWMC is protective of human health and the environment, is cost effective, and makes operational sense. This activity will begin on November 6, 2000 with agreement presumed unless we hear from you prior to that time. Should the decontamination fail to achieve the clean debris standard under RCRA, or fail to reduce the Cs-137 concentrations to meet the INEEL WAC, other disposal options will be pursued.

If you have any questions or comments regarding this document, please contact Carol Hathaway at 208-526-4049 or myself at 208-526-4392.

Sincerely,

Kathleen E. Hain

Kathleen E. Hain, Manager
Environmental Restoration

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f. 42 USC 2201 et seq., *United States Code*, Atomic Energy Act of 1954, August 13, 1954.

Enclosures

Cc: Rick Poeton, EPA, 1200 Sixth Avenue, Seattle, WA 98101; 2 copies
Ted Livieratos, IDHW DEQ; 3 copies
A. Kluk, HQ; 1 copy

File: 6400.5.12
OPE-ER-205-00

bcc: (w/o Encl)
IR File, Steve Baker MS 3915
Frank L. Webber, MS 3950

ID DISTRIBUTION:

CONCURRENCE:

K. Hain (OPE/ER), MS 1117, w/enc. (y) OPE_____
C. Hathaway (OPE/ER, MS 1117, w/enc (w)

RECORD NOTES:

1. This letter was written to transmit the justification for the disposal of low-level waste (piping and soil) from ARA-16 and ARA-25 at the RWMC.

2. C. Hathaway (OPE/ER) wrote this letter for signature by K. Hain (OPE-ER).

3. This letter closes CATS number N/A.

4. The attached correspondence has no relation to the Naval Nuclear Propulsion Program. Naval Reactors concurrence is not required.

DOE F 1325.8
(8-89)
E.O. 12873

United States Government

memorandum

DATE: April 28, 2000

REPLY TO ATTN OF: EM-22

SUBJECT: Disposal Authorization for the Idaho National Engineering Environmental Laboratory Subsurface Disposal Area Low-Level Radioactive Waste Disposal Facility within the Radioactive Waste Management Complex

TO: Beverly Ann Cook, Manager, Idaho Operations Office

The Low-Level Waste Disposal Facility Federal Review Group (LFRG) has conducted a review of the performance assessment and the composite analysis for the Idaho National Engineering Environmental Laboratory (INEEL) Subsurface Disposal Area low-level radioactive waste disposal facility within the Radioactive Waste Management Complex. The review of the performance assessment and the composite analysis was in accordance with the requirements of the DOE Radioactive Waste Management Order, DOE0435.1.

An independent review of the performance assessment and composite analysis was performed by a review team chartered by the LFRG. The compliance evaluation (attached) was prepared by the LFRG based on the input from the review team report and the expert opinions of the LFRG membership. The LFRG used the review team report and the compliance evaluation to develop the disposal authorization statement (attached) which contains the LFRG's recommended formal authorization for disposal operations and the conditions with which the INEEL Subsurface Disposal Area low-level radioactive waste disposal facility must comply.

I have accepted the LFRG recommendation. Therefore, the Idaho Operations Office is authorized to continue operations of the DOE INEEL Subsurface Disposal Area low-level radioactive waste disposal facility subject to the conditions in the disposal authorization statement. Failure by INEEL to comply with these conditions should be reported by the Idaho Operations Office to the LFRG chairmen, and based upon their recommendation to me, could result in the revoking of the authorization and the immediate shutdown of the disposal facility.

Please note the conditions of approval defined in the disposal authorization statement which must be completed by the INEEL to continue authorization of the facility.

If your staff have any questions regarding this action or the process for working with the LFRG on meeting the conditions, they should contact Jay Rhoderick (301) 903-7211 or Bill Murphie (301) 903-7216, co-chairs of the LFRG.

Mark W. Frei
Deputy Assistant Secretary
for Project Completion

Attachments

cc:
Dermot Winters, DNFSB staff

Disposal Authorization Statement
for the
Department of Energy Idaho Operations Office
Idaho National Engineering Environmental Laboratory
Subsurface Disposal Area Low-Level Radioactive Waste Disposal Facility within the Radioactive Waste Management Complex

Revision No: 0
Effective Date: April 25 2000

Background

DOE Radioactive Waste Management Order 435.1 requires that a disposal authorization statement be obtained prior to the construction of a new low-level radioactive waste disposal facility. Field Elements with existing low-level radioactive waste disposal facilities shall obtain a disposal authorization statement in accordance with the schedule in the Complex-Wide Low-Level Waste Management Program Plan. The Disposal Authorization Statement shall be issued based on a review of the facility's Performance Assessment and Composite Analysis or appropriate CERCLA documentation. The Disposal Authorization Statement shall specify the limits and conditions on construction, design, operations, and closure of the low-level radioactive waste facility based on these reviews. The Disposal Authorization Statement is a part of the required radioactive waste management basis for a disposal facility. Failure to obtain a disposal authorization statement or Record of Decision shall result in shutdown of an operational disposal facility or disapproval to initiate construction of a new facility.

Disposal Authorization Statement

In fulfilment of the requirements of DOE Radioactive Waste Management Order 435.1, this Disposal Authorization Statement is hereby issued authorizing the Idaho Operations Office to transfer, receive, possess and dispose of low-level radioactive waste at the Subsurface Disposal Area low-level radioactive waste disposal facility in the Radioactive Waste Management Complex.

The Idaho Operations Office shall conduct its low-level radioactive waste disposal program in accordance with the requirements contained in the following documents.

Radioactive Waste Management Complex Low-Level Waste Radiological Performance Assessment, EGG-WM-8773, May 1994, S. J. Maheras et al.

Letter from S. P. Cowan to J. T. Case, Conditional Acceptance of the Idaho National Engineering Laboratory Radioactive Waste Management Complex Burial Ground Performance Assessment, 8/30/1996.

Addendum to the Radioactive Waste Management Complex Low-Level Waste

Radiological Performance Assessment (EGG-WM-8773), INEEL/EXT-97-00462, April 1997, S. J. Maheras et al.

Radioactive Waste Management Complex Low-Level Waste Radiological Composite Analysis, INEEL/EXT-97-01113, May 1998, J. M. McCarthy et al.

Information Supplement for the Draft Final Radioactive Waste Management Complex Low-Level Waste Radiological Composite Analysis, INEEL/EXT-97-01113, December 15, 1999, T.K. Honeycutt et al,

This Disposal Authorization Statement is subject to all applicable rules and Orders now or hereafter in effect and to all conditions specified below. Also this authorization is applicable to any subsequent revisions and additions to the Performance Assessment and Composite Analysis provided such revisions and additions are in accordance with the performance assessment and composite analysis maintenance program. Applicable permits and reports that comprise the Radioactive Waste Management Basis shall be approved and continue to be maintained current according to the applicable DOE Orders and regulations.

Facility Construction and Design

Disposal operations are to be performed in the Subsurface Disposal Area in the Radioactive Waste Management Complex. Disposal is to be performed in the currently active area Pits 17-20. The design features of the disposal unit in the Subsurface Disposal Area shall conform to the conceptual model used in the Composite Analysis and the Information Supplement. Any changes in the disposal technology, disposal unit, or waste form must be analyzed and authorized according to the performance assessment and composite analysis maintenance program and approved by DOE.

Radionuclide Limits, Waste Form, and Packaging

The disposal unit within the Subsurface Disposal Area shall have waste acceptance criteria which provide specific radionuclide disposal limits, waste form restrictions, and descriptions of acceptable waste packages. The waste acceptance criteria shall be based on the facility Performance Assessment, special analysis, and Composite Analysis (including the information supplement), as well as safety documentation and criticality considerations. Waste acceptance procedures shall be in place that describe requirements for waste characterization, waste certification and record keeping, as well as the process for authorizing deviations from the requirements. All wastes received for disposal at this facility must conform to the waste acceptance procedures. The waste acceptance criteria shall be reviewed and approved through the facility Radioactive Waste Management Basis.

Closure

A closure plan for the Subsurface Disposal Area shall be prepared within one year of the issuance of this disposal authorization statement and submitted to the Idaho Operations Office for review and approval. The closure plan must address any outstanding commitments from the

review of the Radioactive Waste Management Complex Performance Assessment, Composite Analysis and Information Supplement. Any deviations in the closure plan from the closure concept analyzed in the Performance Assessment and Composite Analysis must be analyzed and approved per the Performance Assessment and Composite Analysis maintenance program.

Monitoring

The monitoring plan for the Subsurface Disposal Area shall be written and approved by the Idaho Operations Office and be implemented within one year of the issuance of this disposal authorization statement. The plan shall be updated at least every five years to reflect any changes in facility conditions. The plan shall include monitoring frequencies and protocols for all the data collection required to assess the continued performance of the disposal facilities. This plan shall also include a requirement for comparison of the monitoring results with the Performance Assessment and Composite Analysis results and development of any corrective actions necessary.

Performance Assessment and Composite Analysis Maintenance

Performance Assessment and Composite Analysis Maintenance plans for the Subsurface Disposal Area shall be written and approved by the Idaho Operations Office by September 30, 2000. The Performance Assessment and Composite Analysis Maintenance Program shall follow guidance found in the *Maintenance Guide for U. S. Department of Energy Low-Level Waste Disposal Facility Performance Assessments and Composite Analyses (November 10, 1999).* Changes in the disposal facility operations (e.g., waste form, disposal unit design, radionuclide quantity) or in site policy (e.g., land use plan) or strategy (e.g., closure plans remedial actions) and consequent changes in disposal facility controls shall be managed per the performance assessment and composite analysis maintenance program.

The maintenance plan shall include activities to address each of the following issues identified in the Composite Analysis review and that were not completely addressed in the Performance Assessment and Composite Analysis revisions:

- Perform quantitative uncertainty and sensitivity analysis on all of the key issues and secondary issues in the Review Team report for the Radioactive Waste Management Complex Composite Analysis including radionuclide inventory, corrosion assumptions and upgradient sources.

- Include the information needed to clearly define the assumptions for each portion of the analysis along with justification for these assumptions.

- Address all secondary issues identified in the Composite Analysis Review Team report and all issues noted in Appendix B of the Composite Analysis Review Team report.

Copies of the annual review of the adequacy of the performance assessment and composite analysis shall be provided to the Low-Level Waste Disposal Facility Federal Review Group.

Radioactive Waste Management Complex Composite Analysis Conditions

The Composite Analysis and Performance Assessment for the Radioactive Waste Management Complex shall be revised by September 30, 2000 and submitted to the LFRG for review. The revised Performance Assessment and Composite Analysis shall incorporate the following material included in the Information Supplement:

- Additional source term information regarding the screening of up gradient source terms.
- Uncertainty and sensitivity analysis performed on a revised base case analysis of the Radioactive Waste Management Complex low-level radioactive waste disposal facility performance with the assumptions that a permanent surface barrier will be installed at closure and land use restrictions in the vicinity of the disposal facility will be required.
- Information to clearly define the subsurface pathway flow and transport modeling assumptions along with justification for these assumptions.

The Performance Assessment is to be revised to be consistent with the conceptual model, inventory, source term model, transport model, and site characteristics presented in the Composite Analysis.

In addition, the Idaho Operations Office will ensure the following:

- Maintenance of a minimum 600 meter buffer zone downgradient of the SDA be consistent with the Information Supplement. An options analysis to investigate alternatives to land use restrictions shall be performed.
- Compliance concerns will be addressed in a manner that is consistent with the CERCLA and AEA processes and requirements, and integrated into Idaho Operations Office land use planning including future land use controls. All wastes in the Subsurface Disposal Area, along with other contributing sources shall be considered in the revised Composite Analysis. The CERCLA analysis, and remedial action selected and implemented via a legally binding Record of Decision, will be used to determine a final closure configuration of the Subsurface Disposal Area, the Radioactive Waste Management Complex and all contributing sources.

Violation of Operational Requirements

Performance assessment and composite analysis commitments that are not met will result in the review of the applicability of continued disposal authorization.

Mark W. Frei

Mark W. Frei
Deputy Assistant Secretary
for Office of Project Completion

Date: 4/28/

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Budget			Exp.		Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
2																				
3	Gas			78		78	78	78	78	78	78	78	78	78	78	78	78	78	78	78
4	Electric			70		70	70	70	70	70	70	70	70	70	70	70	70	70	70	70
5	Phone			80		80	80	80	80	80	80	80	80	80	80	80	80	80	80	80
6	Cable			30		X	X	30	30	30	30	30	30	30	30	30	30	30	30	30
7	House			216		X	X	X	X	X	216	216	216	216	216	216	216	216	216	216
8		Misc.				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	Car			100		X	X	X	X	X	X	100	100	100	100	100	100	100	100	100
10		Misc.				X	X	X	X	X	466	X	X	X	X	X	466	X	X	X
11	Providian			100		X	100	100	100	100	100	100	100	100	100	100	100	100	100	100
12	Discover			100		X	100	100	100	100	100	100	100	100	100	100	100	100	100	100
13	Bank of America			100		X	100	100	100	100	100	100	100	100	100	100	100	100	100	100
14	Medical/Dental					X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	Holidays/Birthdays					X	X	X	100	X	100	X	100	200	1000	X	200	100	X	X
16	Vacation					X	X	X	1000	X	X	X	1000	X	X	X	X	X	X	X
17	Misc.	Dentist				29	50	X	X	X	X	X	X	X	X	X	X	X	X	X
18	Ben	owes					82	X	X	X	X	X	X	X	X	X	X	X	X	X
19	Misty	owes					910	X	X	X	X	X	X	X	X	X	X	X	X	X
20	Dameon	owes					345	X	X	X	X	X	X	X	X	X	X	X	X	X

Compliance Evaluation of the Performance Assessment and Composite Analysis for the Disposal of Low-Level Radioactive Waste in the Subsurface Disposal Area within the Radioactive Waste Management Complex at the Idaho National Engineering and Environment Laboratory

The Low-Level Waste Disposal Facility Federal Review Group (LFRG) concludes from its review of the Performance Assessment, Composite Analysis, Information Supplement and Review Team Report for the Radioactive Waste Management Complex that the Performance Assessment and the Composite Analysis were found generally acceptable. Continued waste management operations were determined to be approved with specific conditions as delineated in the disposal authorization statement.

The Performance Assessment for the Radioactive Waste Management Complex was conditionally accepted on August 30, 1996. The performance assessment was judged to provide a reasonable expectation that the DOE Order 5820.2A and DOE Order 435.1 performance objectives will not be exceeded.

The LFRG concluded that the Composite Analysis provided sufficient information to determine that the Subsurface Disposal Area low-level radioactive waste disposal facility within the Radioactive Waste Management Complex operations would not contribute significantly to any composite effects. Therefore, if any adverse exposure concerns resulted, management alternatives should be directed at other sources of radioactive contamination.

The base case analysis results in the following calculated doses relative to the performance measures:

Performance Assessment for the Radioactive Waste Management Complex

PA Component	Measure	Radioactive Waste Management Complex Projected Maximum Dose or flux
All pathways	≤25 mrem/yr	17 mrem/yr
Air Pathway	≤10 mrem/yr	0.86 mrem/yr
Hypothetical inadvertent intruder	100 mrem/yr from chronic exposure 500 mrem/yr from a single event	70 mrem/yr from chronic exposure 190 mrem/yr from a single event
Water resource protection	Established consistent with laws, agreements or groundwater protection management program Idaho adopted the following performance measures for groundwater protection: Beta/photon emitters: 4 mrem/yr Tritium: 20,000 pCi/L Sr-90: 8 pCi/L Radon: 5 pCi/L Gross Alpha: 15 pCi/L Uranium: 20 ug/L	 5.6 mrem/yr 2,300 pCi/L 0.67 pCi/L * * *

* The peak long-term impact occurs long after the 1000 year compliance period (~270,000 years)

Sensitivity/uncertainty analyses were conducted by identifying the modeling parameters to which the results were most sensitive, then evaluating the impacts by using higher and lower input values than those used for the base case. The results of the sensitivity/uncertainty analysis show that the water resource protection performance objective could be exceeded if the long-term release rate from the waste form is significantly larger than the rate used in the base case, the infiltration rate is high, the corrosion rate is high, the inventory is much higher than the base case, and the unsaturated zone is thinner than the base case. However, due to conservatism in the assumptions these results, such as 5.6 mrem/yr for Beta/photon at 100 meters versus 4 mrem/yr for the performance standard are judged to be consistent with a reasonable expectation that the performance target for protecting groundwater will be met and that the measures will not be exceeded at the 600 meter.

Composite Analysis for the Radioactive Waste Management Complex

Composite Analysis Component	Measure	Radioactive Waste Management Complex Projected Maximum Dose
All pathways	Composite Analysis dose constraint of 30 mrem/yr, and dose limit of 100 mrem/yr	27 mrem/yr*

* Revised base case contained in the Composite Analysis Information Supplement.

Sensitivity analysis shows that the values of the parameters used in the base case and the results of the base case are in the conservative portions of their respective ranges. This supports the premise that the performance measure can reasonably be expected to be met.

LFRG Co-Chairs:

Jay E. Rhoderick, Co-Chair

Date: 4/27/00

William E. Murphie, Co-Chair

Date: 4/17/00